

I CLAIM:

1. A water storage, recovery, and treatment apparatus, comprising:

a raw water filtration system having a raw water inlet and a raw water outlet;

a sodium ion exchange system;

5 a reverse osmosis system;

a storage system;

a desalination system;

a heating system;

a distribution system;

10 a piping system, having at least one valve, placing the raw water filtration system, the sodium ion exchange system, the reverse osmosis system, the storage system, the desalination system, the heating system, and the distribution system in fluid communication;

a mobile electrical power system in electrical communication with at least the reverse osmosis system, the desalination system, and the heating system; and

15 a vehicle for transporting the apparatus.

2. The apparatus of claim 1, further including a booster pump system in fluid

communication with the piping system and in electrical communication with the mobile electrical power system.

20

3. The apparatus of claim 1, further including a solar energy collection system in electrical communication with at least the mobile electrical power system.

4. The apparatus of claim 1, further including a compressed air system in electrical communication with the mobile electrical power system.
5. The apparatus of claim 1, further including a distillation system in fluid communication
5 with the piping system.
6. The apparatus of claim 5, wherein the distillation system is a mobile solar distillation system.
- 10 7. The apparatus of claim 5, wherein the distillation system is a single-effect distillation system.
8. The apparatus of claim 7, wherein the single-effect distillation system comprises at least one still tank, at least one baffle, and at least one condenser in fluid communication with the
15 piping system.
9. The apparatus of claim 1, further including a disinfection system in fluid communication with the piping system.
- 20 10. The apparatus of claim 9, wherein the disinfection apparatus is a chlorination system.
11. The apparatus of claim 9, wherein the disinfection system is an ultraviolet light disinfection system.

12. The apparatus of claim 9, wherein the disinfection system is an ozone disinfection system.

5 13. The apparatus of claim 1, further including at least one rainwater collection system in fluid communication with the piping system.

14. The apparatus of claim 1, further including at least one fluid containment and recovery system in fluid communication with the piping system.

10

15. The apparatus of claim 1, wherein the raw water filtration system comprises at least one sand filter.

15

16. The apparatus of claim 1, wherein the raw water filtration system comprises at least one diatomaceous earth filter.

17. The apparatus of claim 1, wherein the raw water filtration system comprises at least one separator, at least one coalescing plate, at least one oil skimmer, at least one reticulated media filter, at least one filter bag, at least one discharge pump, and at least one final filter.

20

18. The apparatus of claim 1, wherein the sodium ion exchange system comprises at least one softener tank and at least one brine tank.

19. The apparatus of claim 1, wherein the storage system comprises at least a potable water storage tank and a non-potable water storage tank.

20. The apparatus of claim 1, wherein the reverse osmosis system comprises at least one RO pump, at least one RO prefilter, and at least one RO membrane.

21. The apparatus of claim 20, wherein the at least one RO membrane is capable of removing from input water at least 87% of lead, 80% of calcium, 80% of magnesium, 90% of iron, 96% of lead, and 95% of total dissolved solids.

22. The apparatus of claim 1, wherein the booster pump system comprises at least one positive displacement high pressure pump.

23. The apparatus of claim 1, wherein the heating system is capable of producing at least a 100 degree F temperature rise at the booster pump system optimal flowrate.

24. The apparatus of claim 1, wherein the distribution system comprises at least one shower head.

25. A water storage, recovery, and treatment apparatus, comprising:
a raw water filtration system comprising at least one separator, at least one coalescing plate, at least one oil skimmer, at least one reticulated media filter, at least one filter bag, at least

one discharge pump, and at least one final filter, the raw water filtration system having a raw water inlet and a raw water outlet;

a sodium ion exchange system further including at least one softener tank and at least one brine tank;

5 a reverse osmosis system further including at least one RO pump, at least one RO prefilter, and at least one RO membrane, wherein the at least one RO membrane is capable of removing from input water at least 87% of lead, 80% of calcium, 80% of magnesium, 90% of iron, 96% of lead, and 95% of total dissolved solids;

10 a storage system storage system further including at least a potable water storage tank and a non-potable water storage tank;

a desalination system;

a heating system capable of producing at least a 100 degree F temperature rise at the booster pump system optimal flowrate;

a distribution system comprising at least one shower head;

15 a piping system, having at least one valve, placing the raw water filtration system, the sodium ion exchange system, the reverse osmosis system, the storage system, the desalination system, the heating system, and the distribution system in fluid communication;

a mobile electrical power system in electrical communication with at least the reverse osmosis system, the desalination system, and the heating system;

20 a booster pump system in fluid communication with the piping system and in electrical communication with the mobile electrical power system;

a compressed air system in electrical communication with the mobile electrical power system;

a disinfection system in fluid communication with the piping system;
at least one fluid containment and recovery system in fluid communication with the piping system; and
a vehicle for transporting the apparatus.

5

26. A water storage, recovery, and treatment apparatus, comprising:

a raw water filtration system having a raw water inlet and a raw water outlet;

a sodium ion exchange system further including at least one softener tank and at least one brine tank;

10

a reverse osmosis system further including at least one RO pump, at least one RO prefilter, and at least one RO membrane, wherein the at least one RO membrane is capable of removing from input water at least 87% of lead, 80% of calcium, 80% of magnesium, 90% of iron, 96% of lead, and 95% of total dissolved solids;

a storage system storage system further including at least a potable water storage tank and

15

a non-potable water storage tank;

a desalination system;

a heating system capable of producing at least a 100 degree F temperature rise at the booster pump system optimal flowrate;

a distribution system comprising at least one shower head;

20

a piping system, having at least one valve, placing the raw water filtration system, the sodium ion exchange system, the reverse osmosis system, the storage system, the desalination system, the heating system, and the distribution system in fluid communication;

at least one rainwater collection system in fluid communication with the piping system;

a distillation system comprising at least one still tank, at least one baffle, and at least one condenser, the distillation system in fluid communication with the piping system;

a mobile electrical power system in electrical communication with at least the reverse osmosis system, the desalination system, and the heating system;

5 a solar energy collection system in electrical communication with at least the mobile electrical power system;

a booster pump system in fluid communication with the piping system and in electrical communication with the mobile electrical power system;

10 a compressed air system in electrical communication with the mobile electrical power system;

a disinfection system further comprising a chlorination system in fluid communication with the piping system;

at least one fluid containment and recovery system in fluid communication with the piping system;

15 a vehicle for transporting the apparatus; and

a central control system designed to automatically control at least the raw water filtration system, the sodium ion exchange system, the reverse osmosis system, the storage system, the heating system, the booster pump system, and the disinfection system.